

U.S. Patent Application Serial No. 09/988,252
Amendment dated October 27, 2003
Reply to OA of April 25, 2003

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (Currently Amended): A method of forming a conductive pattern, comprising the steps of:

(1a) applying a positive[[,]] ~~energy-sensitive~~ thermosensitive paste composition containing a conductive powder to a substrate, followed by drying, to form a positive[[,]] ~~energy-sensitive~~ thermosensitive coating;

(2a) irradiating the coating directly with ~~active-energy rays or heat rays directly or through a mask~~ an infrared laser beam so as to obtain a desired pattern; and

(3a) removing the irradiated part of the coating by development to form a conductive pattern coating.

Claims 2-4 (Canceled)

Claim 5 (Currently Amended): A method according to Claim 1, wherein the positive[[,]] ~~energy-sensitive~~ thermosensitive paste composition further contains a heat-fusible inorganic powder and wherein calcination is carried out after Step (3a).

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Claim 6 (Original): A method according to Claim 5, wherein the heat-fusible inorganic powder is a glass frit.

Claim 7 (Currently Amended): A method of forming a conductive pattern, comprising the steps of:

(1b) applying a positive[[,]] ~~energy-sensitive~~ thermosensitive paste composition containing a conductive powder to a surface of release film, followed by drying, to form a dry film having a positive[[,]] ~~energy-sensitive~~ thermosensitive layer;

(2b) superimposing the dry film onto a substrate in such a manner that the surface of the positive[[,]] ~~energy-sensitive~~ thermosensitive layer is in contact with the substrate, to form a positive[[,]] ~~energy-sensitive~~ thermosensitive coating, and then peeling off the release film;

(3b) irradiating the coating directly with ~~active energy rays or heat rays directly or through a mask~~ infrared laser beam so as to obtain a desired pattern; and

(4b) removing the irradiated part of the coating by development to form a conductive pattern coating.

Claims 8-10 (Canceled)

Claim 11 (Currently Amended): A method according to Claim 7, wherein the positive[[,]] ~~energy-sensitive~~ thermosensitive paste composition further contains a heat-fusible

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inorganic powder and wherein calcination is carried out after Step (4b).

Claim 12 (Original): A method according to Claim 11, wherein the heat-fusible inorganic powder is a glass frit.

Claim 13 (Currently Amended): A method of forming a conductive pattern, comprising the steps of:

- (1c) applying a positive[[,]] ~~energy-sensitive~~ thermosensitive paste composition containing a conductive powder to a surface of release film, followed by drying, to form a dry film having a positive[[,]] ~~energy-sensitive~~ thermosensitive layer;
- (2c) superimposing the dry film onto a substrate in such a manner that the surface of the positive, energy-sensitive layer is in contact with the substrate, to form a positive[[,]] ~~energy-sensitive~~ thermosensitive coating;
- (3c) irradiating the coating through the release film with ~~active energy rays or heat rays through the release film with or without a mask~~ an infrared laser beam so as to obtain a desired pattern; and
- (4c) peeling off the release film, and removing the irradiated part of the coating by development to form a conductive pattern coating.

Claims 14-16 (Canceled)

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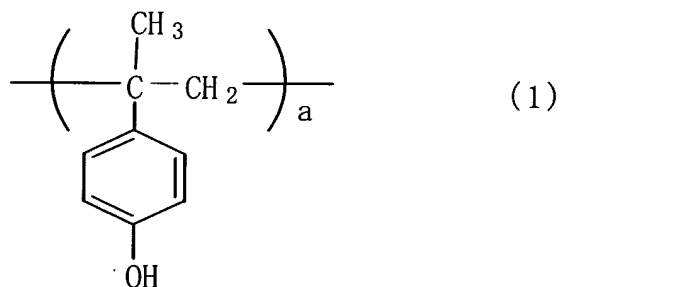
Claim 17 (Currently Amended): A method according to Claim 13, wherein the positive[[,]] ~~energy-sensitive~~ thermosensitive paste composition further contains a heat-fusible inorganic powder and wherein calcination is carried out after Step (4c).

Claim 18 (Original): A method according to Claim 17, wherein the heat-fusible inorganic powder is a glass frit.

Claim 19 (New): A method according to Claim 1, wherein the positive thermosensitive paste composition comprises a thermosensitive resin, an ether linkage-containing olefinic unsaturated compound, a thermal acid generator and a conductive powder,

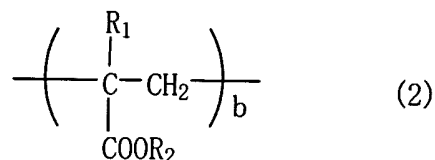
the thermosensitive resin being a copolymer having:

a structural unit represented by Formula (1)



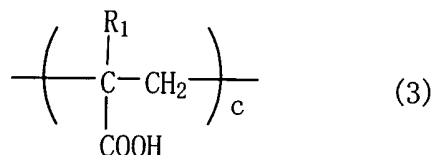
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a structural unit represented by Formula (2)



wherein R₁ is hydrogen or methyl, R₂ is C₁ to C₆ linear or branched unsubstituted alkyl or C₁ to C₆ linear or branched substituted alkyl; and

a structural unit represented by Formula (3)

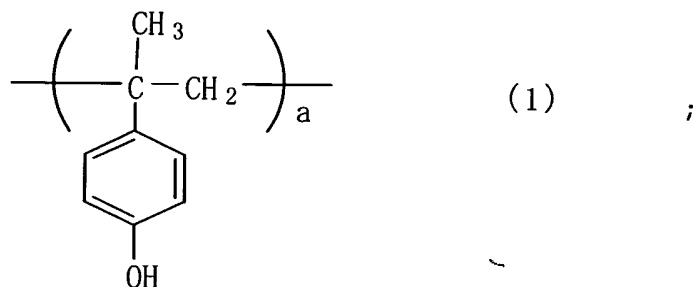


wherein R₁ is hydrogen or methyl;

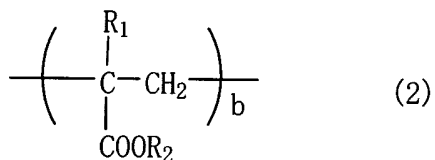
the molar proportions of the structural units being a=0.05 to 0.7, b=0.15 to 0.8 and c=0.01 to 0.5 and the sum of a, b and c being 1.

Claim 20 (New): A method according to Claim 7, wherein the positive thermosensitive paste composition comprises a thermosensitive resin, an ether linkage-containing olefinic unsaturated compound, a thermal acid generator and a conductive powder, the thermosensitive resin being a copolymer having:

a structural unit represented by Formula (1)

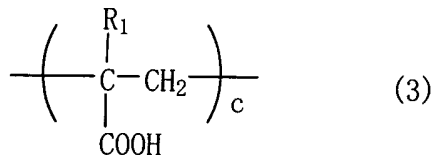


a structural unit represented by Formula (2)



wherein R₁ is hydrogen or methyl, R₂ is C₁ to C₆ linear or branched unsubstituted alkyl or C₁ to C₆ linear or branched substituted alkyl; and

a structural unit represented by Formula (3)



wherein R₁ is hydrogen or methyl; the molar proportions of the structural units being a=0.05 to 0.7, b=0.15 to 0.8 and c=0.01 to 0.5 and the sum of a, b and c being 1.

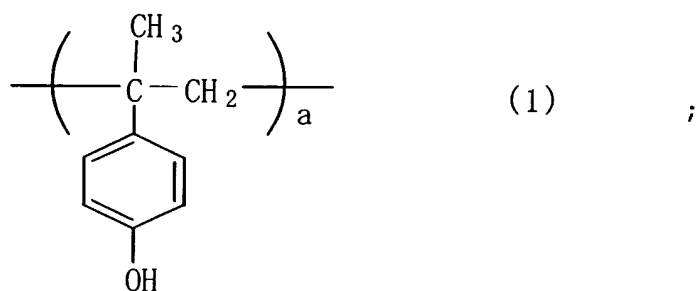
Claim 21 (New): A method according Claim 13, wherein the positive

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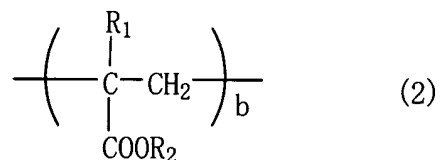
thermosensitive paste composition comprises a thermosensitive resin, an ether linkage-containing olefinic unsaturated compound, a thermal acid generator and a conductive powder,

the thermosensitive resin being a copolymer having:

a structural unit represented by Formula (1)

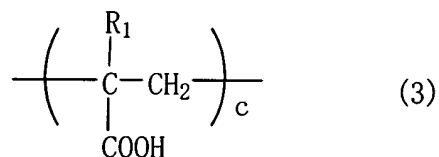


a structural unit represented by Formula (2)



wherein R₁ is hydrogen or methyl, R₂ is C₁ to C₆ linear or branched unsubstituted alkyl or C₁ to C₆ linear or branched substituted alkyl; and

a structural unit represented by Formula (3)



wherein R₁ is hydrogen or methyl; the molar proportions of the structural units being a=0.05 to 0.7,

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$b=0.15$ to 0.8 and $c=0.01$ to 0.5 and the sum of a , b and c being 1 .